

REMARKS**Claim Status**

Claims 49, 50, 52-63, 65-67 and 86 are currently pending. Claims 1-36, 38-48, 64 and 68-85 are withdrawn. Claims 37 and 51 are cancelled.

Applicant note that the withdrawal of Claim 64, 68-75, and 79-84 is subject to non-allowance of the linking (generic) claims, namely Claims 49. According to M.P.E.P. §§809 and 804.01, the linking claims must be examined with the invention elected, and should any linking claim be allowed, the restriction requirement must be withdrawn. Accordingly, should the elected species be found allowable in view of the traversal of the rejection of Claim 49 under 35 U.S.C. §103(a), below, the Examiner should examine the linking claim (Claim 49), and, if allowable, the claims to non-elected species, such as the species of Claims 64, 68-75, and 79-84.

Interview Summary

A Telephonic Interview took place on March 19, 2008 with Examiners LaTanya Bibbins and Wayne Young, representing USPTO, and Alexander Akhiezer, Ph.D. and Timothy J. Meagher, Esq., representing Applicants. The instant rejection and the cited references, U.S. 5,566,387 ("Dewald") and Jang *et al.* "Holographic Data Storage by Combined Use of Peristrophic, Angular, and Spatial Multiplexing", Opt. Eng. 39(11), pp. 2975-2981 (November 2000) were discussed.

Applicants argued that *prima facie* case of obviousness is not established because the combination of references does not teach each and every element of the claimed invention and because modification of references as suggested by the Examiner would result in an inoperable device.

The parties were unable to reach an agreement. The Examiners indicated that Jang is being applied for its "generic teachings" rather than for specific elements that it teaches. The Examiners indicated that the content of the "generic teachings" of Jang will be disclosed to Applicants after Applicants submit the instant Reply.

The Examiner also invited Applicants to provide an explanation of why rotating wedges of Jang are not equivalent to the rotating reflecting surfaces. Applicants provide such explanation in a section titled "*A Combination of the Teachings of Dewald and Jang Would Result in an Inoperable Device*", below.

Claim Rejections Under 35 U.S.C. §103(a)

The Examiner rejected Claims 49, 50, 52, 56-63, 65-67, and 86 are rejected as being unpatentable over U.S. 5,566,387 (“Dewald”) in view of Jang *et al.* “Holographic Data Storage by Combined Use of Peristrophic, Angular, and Spatial Multiplexing”, Opt. Eng. 39(11), pp. 2975-2981 (November 2000).

The Examiner stated that Dewald discloses an apparatus for recording a holographically stored information comprising an aspherical reflecting surface having two focal points (elliptical mirror 76 shown in FIG. 2), an additional reflecting surface (element 70 shown in FIG. 2) and a motive device rotating the additional reflecting surface about a first axis, means for directing an object beam and a reference beam along their respective optical paths, wherein the object and reference beams intersect and form an interference pattern at a storage location in a recording media at or near one of the two focal points. The Examiner acknowledged that Dewald fails to disclose that the motive device rotates either the aspherical reflecting surface or the additional reflecting surface about the second axis, perpendicular to the first axis.

However, the Examiner continued, Jang discloses “a motive device that rotates at least one of either at least one portion of the aspherical reflecting surface or at least one additional reflecting surface about a first axis and, independently, a second axis, perpendicular to the first axis” (Office Action, p. 3, last full paragraph). The Examiner refers to Jang, page 2976, and Sections 2.1 and 2.2. The Examiner stated that it would have been obvious for one of ordinary skill in the art to incorporate the teachings of Jang into the holographic storage apparatus of Dewald. The motivation, the Examiner stated, would be to increase storage capacity by combining multiplexing techniques.

Applicants disagree with the Examiner’s characterization of the teachings of Jang. Applicants further submit that the combination of the teachings of Dewald and Jang does not result in the claimed device. Applicants submit that no reference of record provides a motivation to re-design the device of Dewald to permit either element 70 or element 76 of Dewald’s FIG. 2 to be rotatable about two axes. Finally, Applicants submit that even if combined, the combination of Dewald and Jang will result in an inoperable device.

Combination of Dewald and Jang Fails to Teach Element of Claim 49

As Applicants previously argued, Dewald discloses an apparatus for recording/reading holographically stored information in which holograms may be planar-angle multiplexed. See Dewald, brief description of FIG. 5 and column 11, lines 8-12. Dewald's device is used solely for planar-angle multiplexing, which is accomplished by rotating mirror 70 shown in FIG. 2 around a single axis that is perpendicular to the plane of the drawing. See Dewald, column 6, line 5.

Applicants direct the Examiner's attention to total lack of teaching or suggestion in Dewald of azimuthal multiplexing, much less a combination of azimuthal and planarangle multiplexing. Furthermore, as the Examiner acknowledged referring to Dewald's FIG. 2, Dewald fails to disclose that either mirror 70 or 76 can be rotated around two axes. Thus, it is not only the lack of an additional or two-dimensional motive device that distinguishes Dewald's device from the Applicants' invention. Dewald is also completely devoid of any teachings or suggestions that the described device should, or even *could*, be re-designed to accommodate rotations of either mirror 70 or 76 around *two* axes.

Turning now to Jang, Applicants direct the Examiner's attention to FIG. 2 of Jang, and the corresponding description on page 2977, the paragraph spanning the left and the right columns. The only device described by Jang that comprises an aspherical mirror is the device depicted in FIG. 2(c). Applicants note, however, that the mirrors of the device of FIG. 2(c) are *parabolic* (Jang, p. 2977, left column, last para., lines 1-3). As one of ordinary skill in the art would appreciate, parabolic mirrors *do not have two focal points*. An aspherical reflective surfaces having two focal points, however, is an element of Applicants' Claim 49. Applicants further note that, contrary to the Examiner's statements, *wedge prisms* rather than mirrors are rotated in the device of Jang. (See FIG. 1 and Section 2.1). Wedge prisms in Jang do not function as reflective surfaces. Thus, Jang does *not* teach "a motive device that rotates at least one of either at least one portion of the aspherical reflecting surface or at least one additional reflecting surface", as stated in the Office Action.

Thus, neither Dewald nor Jang teach that an aspherical reflective surface having two focal points or an additional reflecting surface, can rotate around two perpendicular axes. This, however, is an element of Applicants' Claim 49. As such, the combination of Dewald and Jang fails to teach an element of the Applicants invention.

Neither Dewald nor Jang Provide Motivation to Modify One Another

As acknowledged by the Examiner, Dewald fails to teach either a reflecting surface that can be rotated around two axes, or the use of his device to implement multiple methods of multiplexing.

Moreover, because Jang fails to teach *reflective surfaces* rotatable around two perpendicular axes or an aspherical mirrors having *two focal points*, Jang also fails to motivate one of ordinary skill in the art to employ these elements in combination and thus to re-design the device of Dewald in a manner suitable for implementing multiple multiplexing techniques, as claimed by Applicants.

Thus, Jang does not remedy Dewald's failure to teach an element of Applicants' Claim 49 (reflective surfaces rotatable around two axes) or motivate one of ordinary skill to re-design Dewald's device (combined use of reflective surfaces rotatable around two axes and an aspherical reflective surface having two focal points).

A Combination of the Teachings of Dewald and Jang Would Result in an Inoperable Device

Applicants submit that the use of rotatable wedges to control a light beam is not equivalent to the use of rotatable mirrors. This is due to the fact that wedges *refract* light, rather than *reflect* it. The refraction *shifts the path of the light beam*, having the effect of moving the apparent "source" of the portion of the beam that impinges onto the aspherical surface, thus throwing off the alignment of the optical elements of the device. As a result, due to the use of parabolic mirrors (that do *not* have two focal points) and movable wedges to control the light beam, the device of Jang shown in FIG. 2(c) cannot be adapted for use with mirrors that *do* have two focal points.

Applicants note that an intrinsic property of aspherical mirrors having two focal points (*e.g.* ellipsoidal mirrors) is that any ray that passes through a first of the two focal points must also pass through the second focal point or a mirror image of such second focal point with respect to some reflecting surface.

Referring to FIGs. 3, 4A, 4B, 5A, 6 and 7 of the instant application, Applicants note that the "source" of the portion of a beam impinging onto the aspherical mirror (said "source" being rotatable "additional reflective surface" in the indicated figures) is located at or near a first focal

point of the aspherical reflecting surface or at a mirror image of said first focal point with respect to a second additional reflecting surface. The second focus of the aspherical reflecting surface is located on a surface of or within a recording media.

During the operation of an apparatus of the present invention, the rotatable "additional reflective surface" remains at the indicated position, thus ensuring that the beam reflected from the aspherical mirror will be directed to the second focal point at the desired location on or within the recording media. Had this geometrical arrangement not been preserved, the apparatus of the present invention would have failed to record or read an image to/from a desired storage location.

Now referring to FIG. 2 of Jang, Applicants note that the use of movable wedge prisms has an effect of moving the "source" of the portion of a beam impinging onto the parabolic mirror. Indeed, as illustrated in the above-mentioned figure, as the deflected beam emerges from the second wedge prism and is directed towards the parabolic mirror, the apparent "source" of the emergent beam has shifted along the z-axis. The position of this "apparent" source thus depends on the positions of both movable wedge prisms.

It follows that if one were to replace the parabolic mirror with an aspherical mirror having two focal points, placing the wedge prisms at or near a first focal point of the aspherical mirror (or at a mirror image of such first focal point with respect to a some additional reflecting surface) so that the second focus of the aspherical reflecting surface is located on a surface of or within a recording media, the beam reflected from the aspherical mirror would *not always* be directed at the desired location on or within the recording media. The direction of such a beam would depend on the position of the apparent "source" and would depend on the movement of the latter.

In other words, the use of rotatable wedges is incompatible with the use of aspherical mirrors having two focal points.

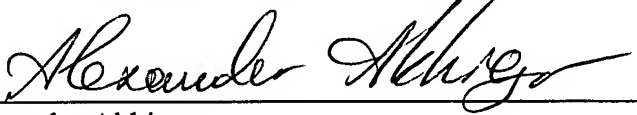
Reconsideration and withdrawal of the rejection are respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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